

WE CLAIM AS OUR INVENTION:

54D B1 1. A method for controlling a dynamic scale for processing mixed postal items having respectively different formats, said dynamic scale having a motor-driven conveyor for moving a postal item in succession through an entry region of the scale, a weighing pan, and a discharge region of the scale, said method comprising the steps of:

in a dynamic operating mode, supplying a piece of mail to said entry region of the scale at a predetermined regulated conveying speed which is independent of the format of the piece of mail, and conveying said piece of mail through said entry region of the scale to said weighing pan;
deactivating regulation of the conveying speed during a measuring time range while said postal item is on said weighing pan and obtaining a weight measurement of said postal item; and
after said measuring time span, re-activating regulation of the conveying speed and moving said postal item at said conveying speed from said weighing pan through said discharge region of said scale.

2. A method as claimed in claim 1 comprising, in said dynamic operating mode, the steps of:

maintaining said conveying speed at said predetermined, regulating conveying speed before a beginning of said measuring time span;
sensing when said postal item is located in said entry region of the scale; and

upon sensing that said postal item has exited said entry region of the scale, supplying unregulated voltage pulses to the motor driving said conveyor during said measuring time span to operate said conveyor with a predetermined power without regulation of said conveying speed, and tensioning said conveyor to reduce said conveying speed of said postal item during said measuring time span dependent on a weight of said postal item.

3. A method as claimed in claim 1 wherein said dynamic scale is used with a further processing station having a further processing station conveying speed, and regulating said conveying speed in said dynamic scale dependent on said further processing station conveying speed to produce an output of postal items from said dynamic scale which is approximately 66% of an output of postal items from said further processing station.

4. A method as claimed in claim 1 comprising the steps of:
evaluating said weight measurement of said postal item in said dynamic operating mode; and
dependent on the evaluation of said weight measurement, directly transporting said postal item through said discharge region of said scale or switching into a further operating mode and statically weighing said postal item on said weighing pan in said further operating mode.

5. A method as claimed in claim 4 comprising the steps, in said further operating mode, of:

reversing a conveying direction of said conveyor for statically weighing said postal item; and

subsequently again reversing the conveying speed of said conveyor after statically weighing said postal item to convey said postal item through said discharge region of said scale.

6. A method as claimed in claim 4 comprising, in said further operating mode, conveying said postal item at a constant conveying speed through said discharge region of said scale.

7. A method as claimed in claim 1 comprising the steps of:

evaluating said weight measurement of said postal item and identifying if said weight measurement is likely to be imprecise; and

if said weight measurement is likely to be imprecise, switching into a further operating mode and conveying said postal item directly through said discharge region of said scale and assigning a weight value to said postal item in place of said weight measurement, said weight value being higher than said weight measurement which is likely to be imprecise.

8. A dynamic scale comprising:

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a conveyor arrangement for conveying postal items having a conveyor belt driven by a motor;


a scale housing having entry region for postal items and a discharge region for postal items;

a weighing pan connected to a weighing cell, said weighing pan being disposed between said entry region and said discharge region and said conveyor arrangement conveying a postal item in succession through said entry region, said weighing pan and said discharge region; and

a controller which operates said motor to move said belt at a predetermined, regulated conveying speed when a postal item enters said entry region, said controller deactivating regulation of said conveying speed while said postal item is disposed on said weighing pan during a measuring time span during which a weight measurement of said postal item is made and, after said measuring time span, said controller re-activating regulation of said conveying speed to move said postal item on said belt through said discharge region.

9. A dynamic scale as claimed in claim 8 wherein said weighing pan has a center of gravity, and wherein said weighing pan is mechanically connected to said weighing cell substantially at said center of gravity.

10. A dynamic scale as claimed in claim 8 wherein said housing has a guide wall disposed below said conveyor belt, and wherein said housing comprises a support


mechanism for supporting said conveyor belt above and close to said lower guide wall, and wherein said lower guide wall in said discharge region comprises an adapter for transferring a postal item from said discharge region to a downstream apparatus.

11. A dynamic scale as claimed in claim 8 wherein said motor has a switchable direction of operation for moving said conveyor belt in a forward conveying direction and in a reverse conveying direction, and further comprising a driver connected between said controller and said motor for switching said motor, dependent on a signal from said controller, to selectively move said conveyor belt in one of said first conveying direction and said second conveying direction.

12. A dynamic scale as claimed in claim 11 wherein said motor comprises a DC motor operated with a voltage having a polarity, and wherein said driver switches said polarity of said voltage to switch said motor to move said conveyor belt in said reverse conveying direction.

13. A dynamic scale as claimed in claim 11 comprising a switchable transmission, and wherein said controller switches said transmission to operate said motor to move said conveyor belt in said reverse conveying direction.

14. A dynamic scale as claimed in claim 8 comprising a support mechanism for said conveyor belt comprising two carrier plates and a supporting plate disposed between said two carrier plates, each of said carrying plates being connected to said

weighing pan, and a tensioning arrangement for setting a tension of said conveyor belt, said tensioning arrangement being mounted to said carrier plates, and said conveyor belt being substantially non-elastic at least in a direction corresponding to a conveying direction of said postal item.

15. A dynamic scale as claimed in claim 14 wherein said tensioning arrangement comprises at least one adjustable tension spring for setting said tension.

16. A dynamic scale as claimed in claim 15 wherein said tensioning arrangement comprises a tensioning roller around which said conveyor belt is entrained, said tensioning roller being mounted on a tensioning shaft, said tensioning shaft having opposite ends each receiving a guide pin, respective helical springs wound around each guide pin, two stop plates respectively attached to said carrier plates, each guide pin having a nut screwed thereon and said stop plate being disposed between said nut and said tensioning shaft with each helical spring being compressed between one of said nuts and one of said stop plates, each helical spring being compressively pre-stressed.

17. A dynamic scale as claimed in claim 16 wherein said guide pins are respectively received in said tensioning shaft so as not to rotate within said tensioning shaft, and further comprising, for each guide pin, a securing ring which prevents the guide pin from sliding out of said tensioning shaft.

18. A dynamic scale as claimed in claim 16 wherein each of said carrier plates has an oblong hole therein, the respective oblong holes receiving said tensioning shaft and allowing said tensioning shaft to glide therein when said conveyor belt is tensioned by said tensioning roller.

19. A dynamic scale as claimed in claim 8 comprising a drive roller entrained by said conveyor belt and driven by said motor, said drive roller comprising a sand-blasted aluminum pinion, and said conveyor belt being comprised of a low-stretch fabric having a glide coating facing said drive roller and allowing a predetermining slippage between said drive roller and said conveyor belt dependent on a belt tension of said conveyor belt.

20. A dynamic scale as claimed in claim 19 wherein said glide coating is comprised of plastic.

21. A dynamic scale as claimed in claim 8 wherein said housing has a lower guide wall having a width substantially equal to a width of said conveyor belt and having a length which is less than a length of a conveying path for postal items formed by said conveyor belt.

22. A dynamic scale as claimed in claim 8 wherein said weighing pan has a back wall for guiding a postal item, said conveyor belt forming a base of said weighing pan at an angle relative to said back wall.

23. A dynamic scale as claimed in claim 8 wherein said weighing pan is mechanically connected to said weighing cell substantially at a center of gravity of a combination of said weighing pan and a postal item, having highest permitted dimensions, when said postal item having highest permitted dimensions is disposed centrally on said weighing pan.

24. A dynamic scale as claimed in claim 8 wherein said weighing pan is comprised of flexurally and torsionally stiff lightweight material and has a back wall comprising a central force transfer element to said weighing cell.

25. A dynamic scale as claimed in claim 24 wherein said back wall of said weighing pan is comprised of a one-piece sandwich structure.

26. A dynamic scale as claimed in claim 8 further comprising a speed sensor mechanically connected to said motor and supplying a signal to said controller identifying a speed of said motor for use by said controller in regulating said conveying speed.

27. A dynamic scale as claimed in claim 26 wherein said speed sensor comprises an encoder.

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